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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,165	06/29/2001	Katsumasa Yoshii	9281-4130	7425

7590 10/03/2002

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EXAMINER

NGUYEN, HOAN C

ART UNIT PAPER NUMBER

2871

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,165

Applicant(s)

YOSHII ET AL.

Examiner

HOAN C. NGUYEN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-16 is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features in claim 10:

- the peripheral curved surface being a part of a first sphere having a first radius,
- the bottom curved surface being a second sphere having a second radius different from the first radius,

wherein

- the first radius is smaller than the second radius,
- a normal line extending from a center of the first sphere to the reflector surface and a normal line extending from a center of the second sphere to the reflector surface are not collinear.

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 7 are rejected since the term "an inclination angle is maximum" is a relative term which renders the claim indefinite. The term "maximum" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Applicant needs to provide standard of "an inclination angle is maximum". Therefore, the prior art (Fig. 15) can consider "an inclination angle being maximum"

Claim 9 is rejected since the term "the maximum inclination angle of the concave surface of each of the plurality of the concave portions is aligned to be on a far side from a viewpoint of an observer" is a relative term which renders the claim indefinite. The term "a far side" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Applicant needs to provide standard of "a far side."

Claims 2-6 and 8 are rejected since they depend on the infinite claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims 1-6 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by Prior Art (Figs.15-16) admitted by applicant.

In regard to claim 1-2, applicant admits (Fig. 15, page 2 line 14 to page 3 line 3) a prior art that a reflector comprising a plurality of light reflective concave portions formed on a surface of a base material, each of the concave portions being a concave surface and being formed so that an inclination angle (an absolute value of an angle between a plane tangential to a point on the concave surface and the surface of the base material) is maximum on a side portion of the curved surface;
wherein

- the concave surface of each of the concave portions has a single minimal point (a point where the inclination angle becomes zero) according to claim 2.
- the maximum inclination angle (an absolute value) is about 22° (depth about $1\mu\text{m}$ in a range of $0.1\text{-}3\mu\text{m}$ and pitch about $5\mu\text{m}$ in a range $5\text{-}50\mu\text{m}$, thus $\arctan(1/2.5) = 22^\circ$), which is in a range of 2° to 80° according to claim 3 and in a range of 4° to 35° according to claim 4

- the plurality of the concave portions are formed randomly with a depth thereof ranging from 0.1 μm to 3 μm (page 2 lines 27) according to claim 5.
- each of the plurality of the concave portions are arranged irregularly adjacent to each other according to claim 6.
- the reflector is mounted on LCD device according to claim 8.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1 and 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Akins et al. (US6285425B1).

Akins et al. teach (Fig. 6) a reflector, comprising a plurality of light reflective concave portions formed on a surface of a base material, each of the concave portions being a concave surface and being formed so that an inclination angle (an absolute value of an angle between a plane tangential to a point on the concave surface and the surface of the base material) is maximum on a side portion of the curved surface.

wherein

- the plurality of the concave portions are formed so that the side portion having the maximum inclination angle of the concave surface is aligned in a particular direction according to claim 8.

- the reflector is formed so that the side portion having the maximum inclination angle of the concave surface of each of the plurality of the concave portions is aligned in a certain direction and is mounted so that the side portion having the maximum inclination angle of the concave surface of each of the plurality of the concave portions can be aligned to be on a far side from a viewpoint of an observer according to claim 9.

Allowable Subject Matter

Claims 10-16 are allowed. The following is an examiner's statement of reasons for allowance:

Claim 10 is allowed since there is no prior teaches reflector comprising

- plurality of concave portions formed on a reflector surface,
- an inner surface of each of the concave portions including a bottom curved surface and a peripheral curved surface,
- the peripheral curved surface being a part of a first sphere having a first radius,
- the bottom curved surface being a second sphere having a second radius larger than the first radius, and the bottom curved surface being located within the peripheral curved surface,

wherein a normal line extending from a center of the first sphere to the reflector surface and a normal line extending from a center of the second sphere to the reflector surface are not collinear.

Claims 11-16 are allowed since they depend on the allowed claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Mizobata et al. (US6266112B1) disclose a reflective liquid crystal display with a convex-concave at the reflecting surface of the reflector wherein a fine control of a shape such as an inclined angle of the convex-concave is difficult.
- Tanada (US6199992B1) discloses a display device using the reflector, which has three-dimensional concavity, such as a spherical concavity, having concave curves in cross section as shown in FIG. 1 or 3.
- Sasaki et al. (US6219120B1) disclose a liquid crystal display with corrugated reflective surface, which are curvature radius less than 100 μ m, a depth about 0.5-5 μ m and the width less than 45 μ m.
- Doriguzzi et al. (US4106859) disclose reflector with light-scattering surface for LCD, wherein chromium layer covering depressions forms reflector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (703)

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306-0472. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, SIKES L WILLIAM can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8178 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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September 24, 2002

TOANTON
PRIMARY EXAMINER